

Prescription Pain and Other Medications

Prescription medications such as pain relievers, tranquilizers, stimulants, and sedatives are very useful treatment tools but sometimes people do not take them as directed and may become addicted. Pain relievers make surgery possible, and enable many individuals with chronic pain to lead productive lives. Most people who take prescription medications use them responsibly. However, the inappropriate or nonmedical use of prescription medications is a serious public health concern. Nonmedical use of prescription medications like opioids, central nervous system (CNS) depressants, and stimulants can lead to abuse and addiction, characterized by compulsive drug seeking and use.

Patients, healthcare professionals, and pharmacists all have roles in preventing misuse and addiction to prescription medications. For example, when a doctor prescribes a pain relief medication, CNS depressant, or stimulant, the patient should follow the directions for use carefully, learn what effects the medication could have, and determine any potential interactions with other medications. The patient should read all information provided by the pharmacist. Physicians and other healthcare providers should screen

for any type of substance abuse during routine history-taking, with questions about which prescriptions and over-the-counter medicines the patient is taking and why. Over time, providers should note any rapid increases in the amount of a medication needed—which may indicate the development of tolerance—or frequent requests for refills before the quantity prescribed should have been used.

Commonly Abused Prescription Medications ———

While many prescription medications can be abused or misused, these three classes are most commonly abused:

- Opioids—often prescribed to treat pain.
- CNS Depressants—used to treat anxiety and sleep disorders.
- Stimulants—prescribed to treat narcolepsy and attention deficit/hyperactivity disorder.

Opioids

Opioids are commonly prescribed because of their effective analgesic, or pain relieving, properties. Many studies have shown that properly managed

medical use of opioid analgesic compounds is safe and rarely causes addiction, which is defined as compulsive, often uncontrollable use. Taken exactly as prescribed, opioids can be used to manage pain effectively.

Among the compounds that fall within this class—sometimes referred to as narcotics—are morphine, codeine, and related medications. Morphine is often used before or after surgery to alleviate severe pain. Codeine is used for milder pain. Other examples of opioids that can be prescribed to alleviate pain include oxycodone (OxyContin—an oral, controlled release form of the drug); propoxyphene (Darvon); hydrocodone (Vicodin); hydro-morphine (Dilaudid); and meperidine (Demerol), which is used less often because of side effects. In addition to their effective pain relieving properties, some of these medications can be used to relieve severe diarrhea (Lomotil, for example, which is diphenoxylate) or severe coughs (codeine).

Opioids act by attaching to specific proteins called opioid receptors, which are found in the brain, spinal cord, and gastrointestinal tract. When these compounds attach to certain opioid receptors in the brain and spinal cord, they can effectively change the way a person experiences pain.

In addition, opioid medications can affect regions of the brain that mediate what we perceive as pleasure, resulting in the

initial euphoria that many opioids produce. They can also produce drowsiness, cause constipation, and, depending upon the amount taken, depress breathing. Taking a large single dose could cause severe respiratory depression or death.

Opioids may interact with other medications and are only safe to use with other medications under a physician's supervision. Typically, they should not be used with substances such as alcohol, antihistamines, barbiturates, or benzodiazepines. Since these substances slow breathing, their combined effects could lead to life-threatening respiratory depression.

Chronic use of opioids can result in tolerance to the medications so that higher doses must be taken to obtain the same initial effects. Long-term use also can lead to physical dependence—the body adapts to the presence of the substance and withdrawal symptoms occur if use is reduced abruptly. Individuals taking prescribed opioid medications should not only be given these medications under appropriate medical supervision, but also should be medically supervised when stopping use in order to reduce or avoid withdrawal symptoms. Symptoms of withdrawal can include restlessness, muscle and bone pain, insomnia, diarrhea, vomiting, cold flashes with goose bumps (“cold turkey”), and involuntary leg movements.

Individuals who become addicted to prescription medications can be treated.

Options for effectively treating addiction to prescription opioids are drawn from research on treating heroin addiction. Some pharmacological examples of available treatments follow:

- Methadone, a synthetic opioid that blocks the effects of heroin and other opioids, eliminates withdrawal symptoms and relieves craving. It has been used for over 30 years to successfully treat people addicted to opioids.
- Naltrexone is a long-acting opioid blocker often used with highly motivated individuals in treatment programs promoting complete abstinence. Naltrexone also is used to prevent relapse.
- Buprenorphine, another synthetic opioid, is a recent addition to the arsenal of medications for treating addiction to heroin and other opiates.
- Naloxone counteracts the effects of opioids and is used to treat overdoses.

Central Nervous System (CNS) Depressants

CNS depressants slow normal brain function. In higher doses, some CNS depressants can become general anesthetics. Tranquilizers and sedatives are examples of CNS depressants.

CNS depressants can be divided into two groups, based on their chemistry and pharmacology:

- Barbiturates, such as mephobarbital (Mebaral) and pentobarbital sodium (Nembutal), which are used to treat anxiety, tension, and sleep disorders.
- Benzodiazepines, such as diazepam (Valium), chlordiazepoxide HCl (Librium), and alprazolam (Xanax), which can be prescribed to treat anxiety, acute stress reactions, and panic attacks. Benzodiazepines that have a more sedating effect, such as estazolam (ProSom), can be prescribed for short-term treatment of sleep disorders.

There are many CNS depressants, and most act on the brain similarly—they affect the neurotransmitter gamma-aminobutyric acid (GABA). Neurotransmitters are brain chemicals that facilitate communication between brain cells. GABA works by decreasing brain activity. Although different classes of CNS depressants work in unique ways, ultimately it is their ability to increase GABA activity that produces a drowsy or calming effect. Despite these beneficial effects for people suffering from anxiety or sleep disorders, barbiturates and benzodiazepines can be addictive and should be used only as prescribed.

CNS depressants should not be combined with any medication or substance that causes sleepiness, including prescription pain medicines, certain over-the-counter cold and allergy medications, or alcohol.

If combined, they can slow breathing, or slow both the heart and respiration, which can be fatal.

Discontinuing prolonged use of high doses of CNS depressants can lead to withdrawal. Because they work by slowing the brain's activity, a potential consequence of abuse is that when one stops taking a CNS depressant, the brain's activity can rebound to the point that seizures can occur. Someone thinking about ending their use of a CNS depressant, or who has stopped and is suffering withdrawal, should speak with a physician and seek medical treatment.

In addition to medical supervision, counseling in an in-patient or out-patient setting can help people who are overcoming addiction to CNS depressants. For example, cognitive-behavioral therapy has been used successfully to help individuals in treatment for abuse of benzodiazepines. This type of therapy focuses on modifying a patient's thinking, expectations, and behaviors while simultaneously increasing their skills for coping with various life stressors.

Often the abuse of CNS depressants occurs in conjunction with the abuse of another substance or drug, such as alcohol or cocaine. In these cases of polydrug abuse, the treatment approach should address the multiple addictions.

Stimulants

Stimulants increase alertness, attention, and energy, which are accompanied by increases in blood pressure, heart rate, and respiration.

Historically, stimulants were used to treat asthma and other respiratory problems, obesity, neurological disorders, and a variety of other ailments. As their potential for abuse and addiction became apparent, the use of stimulants began to wane. Now, stimulants are prescribed for treating only a few health conditions, including narcolepsy, attention-deficit hyperactivity disorder (ADHD), and depression that has not responded to other treatments. Stimulants may also be used for short-term treatment of obesity and for patients with asthma.

Stimulants such as dextroamphetamine (Dexedrine) and methylphenidate (Ritalin) have chemical structures that are similar to key brain neurotransmitters called monoamines, which include norepinephrine and dopamine. Stimulants increase the levels of these chemicals in the brain and body. This, in turn, increases blood pressure and heart rate, constricts blood vessels, increases blood glucose, and opens up the pathways of the respiratory system. In addition, the increase in dopamine is associated with a sense of euphoria that can accompany the use of stimulants.

Research indicates that people with ADHD do not become addicted to stimulant medications, such as Ritalin, when taken in the form and dosage prescribed.¹ However, when misused, stimulants can be addictive.

The consequences of stimulant abuse can be extremely dangerous. Taking high doses of a stimulant can result in an irregular heartbeat, dangerously high body temperatures, and/or the potential for cardiovascular failure or seizures. Taking high doses of some stimulants repeatedly over a short period of time can lead to hostility or feelings of paranoia in some individuals.

Stimulants should not be mixed with antidepressants or over-the-counter cold medicines containing decongestants. Antidepressants may enhance the effects of a stimulant, and stimulants in combination with decongestants may cause blood pressure to become dangerously high or lead to irregular heart rhythms.

Treatment of addiction to prescription stimulants, such as methylphenidate and amphetamines, is based on behavioral therapies proven effective for treating cocaine or methamphetamine addiction. At this time, there are no proven medications for the treatment of stimulant addiction. Antidepressants, however, may be used to manage the symptoms of

depression that can accompany early abstinence from stimulants.

Depending on the patient's situation, the first step in treating prescription stimulant addiction may be to slowly decrease the drug's dose and attempt to treat withdrawal symptoms. This process of detoxification could then be followed with one of many behavioral therapies. Contingency management, for example, improves treatment outcomes by enabling patients to earn vouchers for drug-free urine tests; the vouchers can be exchanged for items that promote healthy living. Cognitive-behavioral therapies, which teach patients skills to recognize risky situations, avoid drug use, and cope more effectively with problems, are proving beneficial. Recovery support groups may also be effective in conjunction with a behavioral therapy.

Trends in Prescription Medication Abuse —————

2003 Monitoring the Future Survey (MTF)*

MTF assesses the extent and perceptions of drug use among 8th, 10th, and 12th grade students nationwide. The 2003 survey showed that the lifetime, annual, and 30-day** use of tranquilizers declined significantly from 2002 to 2003 for

¹ Nora Volkow, et al., Dopamine Transporter Occupancies in the Human Brain Induced by Therapeutic Doses of Oral Methylphenidate, *Am J Psychiatry* 155:1325–1331, October 1998.

10th- and 12th-graders. This is the first year of decline for 12th-graders after a decade of gradual increase; past year use went from 7.7 percent in 2002 to 6.7 percent in 2003. For 10th-graders, it is the second year of decline for annual use, down from 7.3 percent in 2001 to 5.3 percent in 2003. In general, 8th-graders' rates of reported tranquilizer use have been considerably lower (about 2.7 percent for annual use) than those observed in the upper grades.

Like tranquilizers, sedative use had shown a decade-long rise among high school seniors before leveling at 9.5 percent in 2002 and 8.8 percent in 2003.

Only 12th grade data are reported for abuse of narcotics other than heroin in the MTF. The annual prevalence of this class of drugs had risen considerably from 3.3 percent in 1992 to 7 percent in 2000 and 6.7 percent in 2001. In 2002, the survey item was changed to incorporate two new specific pain relievers, OxyContin (a controlled-release form of oxycodone that can cause severe health consequences if crushed and ingested) and Vicodin (hydrocodone), and separate items asking about use of these drugs also were introduced. Following the change in the other narcotics item, past year use was reported by 9.4 percent of seniors in 2002 and 9.3 percent in 2003.

Although not significantly higher than in 2002, annual OxyContin use was reported in 2003 by 4.5 percent of 12th-

graders, 3.6 percent of 10th-graders, and 1.7 percent of 8th-graders. The annual prevalence rate for Vicodin was considerably higher than for OxyContin, at 10.5 percent in 12th-graders, 7.2 percent in 10th-graders, and 2.8 percent in 8th-graders in 2003. Considering the addictive potential of oxycodone and hydrocodone, these are disturbingly high rates of use—contrasting with an annual prevalence of less than 1 percent in all three grades for heroin, for instance.

2002 National Survey on Drug Use and Health (NSDUH)***

According to the 2002 NSDUH, an estimated 6.2 million persons, or 2.6 percent of the population, age 12 and older had used prescription medications nonmedically in the month prior to being surveyed. This includes 4.4 million using pain relievers, 1.8 million using tranquilizers, 1.2 million using stimulants, and 0.4 million using sedatives. While prescription drug abuse affects many Americans, some trends of particular concern can be seen among older adults, adolescents, and women.

Lifetime prevalence of pain reliever abuse among youth aged 12 to 17 increased from 9.6 percent in 2001 to 11.2 percent in 2002, continuing an increasing trend from 1989 (1.2 percent). Among young adults aged 18 to 25, the rate increased from 19.4 percent in 2001 to 22.1 percent in 2002; the young adult rate was 6.8 percent in 1992.

In 2002, approximately 1.9 million people aged 12 and older had used OxyContin nonmedically at least once in their lifetimes. An estimated 360,000 Americans received treatment for pain reliever abuse in the past year. The number of new pain reliever users increased from 628,000 in 1990 to 2.4 million in 2001; over half (52 percent) of the new users in 2001 were female.

Lifetime nonmedical use of stimulants increased steadily from 1990 to 2002 for youth aged 12 to 17 (0.7 percent to 4.3 percent). Rates increased between 2001 and 2002 for both youth (3.8 percent to 4.3 percent) and young adults (10.2 percent to 10.8 percent).

2002 Drug Abuse Warning Network (DAWN)****

DAWN collects data on drug-related hospital emergency department (ED) episodes. The latest DAWN findings indicate that drug abuse-related ED episodes involving certain prescription drugs, particularly the benzodiazepines and narcotic analgesics (pain relievers), continued to rise between 1995 and 2002. ED mentions of benzodiazepines increased 38 percent, and mentions of narcotic analgesics/combinations increased from 45,000 to nearly 120,000. By the end of 2002, ED mentions of benzodiazepines and narcotic

analgesics/combinations were about as frequent as mentions of heroin or marijuana but ranked below cocaine and alcohol.

Long-term findings indicate that ED mentions of unspecified narcotics, as well as those containing hydrocodone, oxycodone, and methadone rose substantially from 1995 to 2002, increasing 160 percent for hydrocodone combinations, 176 percent for methadone, 341 percent for unspecified narcotic analgesics, and 560 percent for oxycodone/combinations. ED mentions of oxycodone/combinations doubled from 2000 to 2002.

From 2001 to 2002, ED mentions of narcotic analgesics/combinations rose 20 percent. From 2000 to 2002, the increase was 45 percent, and over the 8-year period from 1995 to 2002, ED mentions rose 163 percent. Overall, narcotic analgesics/combinations comprised 10 percent of total ED mentions in the United States in 2002.

In 2002, there were 105,752 mentions of benzodiazepines in hospital EDs, an increase of 16 percent from 2000. Mentions of alprazolam (Xanax) rose 25 percent during that period.

For more information on addiction to prescription medications, visit <http://www.drugabuse.gov/drugpages/prescription.html>.

* These data are from the 2003 Monitoring the Future Survey, funded by the National Institute on Drug Abuse, National Institutes of Health, DHHS, and conducted by the University of Michigan's Institute for Social Research. The survey has tracked 12th-graders' illicit drug use and related attitudes since 1975; in 1991, 8th- and 10th-graders were added to the study. The latest data are online at www.drugabuse.gov.

** "Lifetime" refers to use at least once during a respondent's lifetime. "Annual" refers to use at least once during the year preceding an individual's response to the survey. "30-day" refers to use at least once during the 30 days preceding an individual's response to the survey.

*** NSDUH (formerly known as the National Household Survey on Drug Abuse) is an annual survey conducted by the Substance Abuse and Mental Health Services Administration. Copies of the latest survey are available at www.samhsa.gov.

**** These data are from the annual Drug Abuse Warning Network, funded by the Substance Abuse and Mental Health Services Administration, DHHS. The survey provides information about emergency department visits that are induced by or related to the use of an illicit drug or the nonmedical use of a legal drug. The latest data (2002) are at www.samhsa.gov.



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